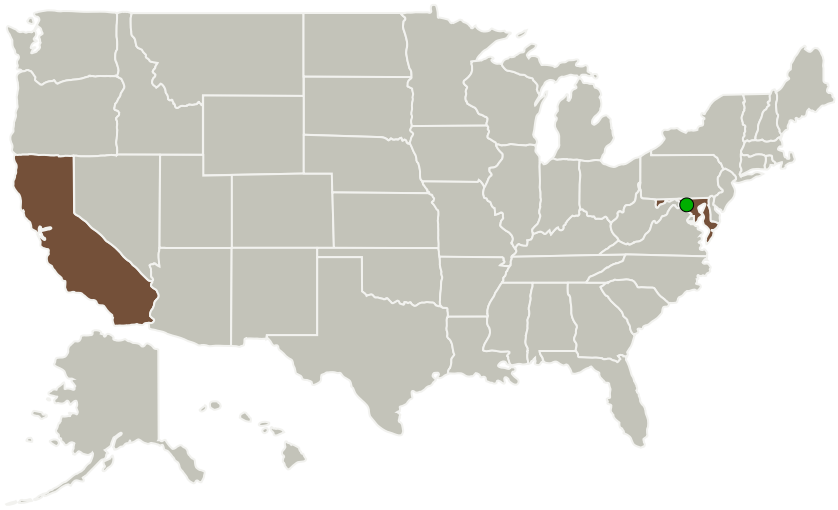
Multifunctional Integrated Photonic Lab-on-a-Chip for Astronaut Health Monitoring, Phase I

Completed Technology Project (2017 - 2018)

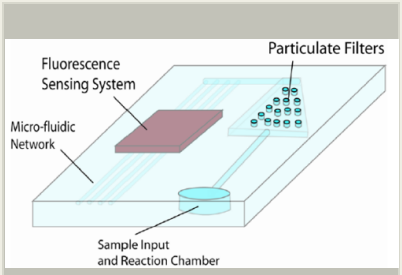
Project Introduction

Astronauts do not have a simple and reliable method to accurately and in real-time monitor their health during missions. IFOS proposes an innovative miniaturized blood monitoring lab-on-a-chip to directly monitor astronaut health in real-time. IFOS' innovative system comprises a miniaturized biosensor based on photonic integrated circuits and sensitive fluorescent assay. While IFOS' initial focus will be on measurement of total protein concentration in blood, IFOS will leverage and build upon pioneering work done by collaborator Stanford University to enable multi-analyte sensing. The implementation of the blood monitoring device on Gallium Arsenide (GaAs) will enabling a form factor of 1 cubic inch at competitive cost.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Intelligent Fiber Optic Systems Corporation	Lead Organization	Industry	Santa Clara, California
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
Stanford University Computer Science	Supporting Organization	Academia	Stanford, California



Multifunctional Integrated Photonic Lab-on-a-Chip for Astronaut Health Monitoring, Phase I Briefing Chart Image

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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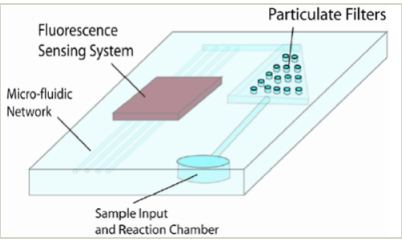
Primary U.S. Work Locations	
California	Maryland

Images



Briefing Chart Image
Multifunctional Integrated Photonic Lab-on-a-Chip for Astronaut Health Monitoring, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/135237)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Intelligent Fiber Optic Systems Corporation

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

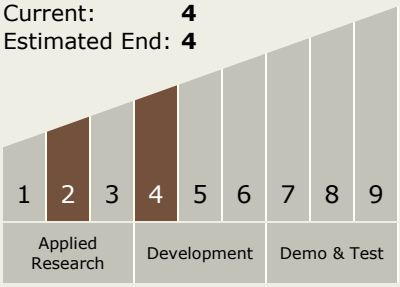
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Behzad Moslehi

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System